



Teacher's Guide

"BE AN INVENTOR"

TEACHER'S GUIDE

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"BE AN INVENTOR"

Your Students' Recipe
For Using Creative Thinking
To Make the World a Better Place.

TEACHER'S GUIDE

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WHY "BE AN INVENTOR?"

- THEMATIC ACTIVITY THAT TEACHES:
 - Writing - Researching - Problem-solving
 - Drawing - Building - Public Speaking
- PARENTAL PARTICIPATION
- INCREASED SELF ESTEEM
- FUN

This video program is intended for students in grades two through six. The viewing time is 22 minutes.

PROGRAM OBJECTIVES

After viewing the video and becoming inventors, your students will be able to . . .

- Describe what an invention is and explain its two main features.
- Explain the three main qualities of inventors.
- Demonstrate some of the techniques used to enhance creativity and inventive thinking.
- Explain the steps that one takes to become an inventor.
- Display an actual working invention of their own creation.
- Display an inventor's notebook containing notes, drawings, descriptions and a patent.
- "Market" their invention to others by describing and showing off its benefits.

INSPIRE CREATIVITY

- **Be positive.** All ideas have value, especially in the early stages. Deny nothing. Encourage everything.
- **Have fun.** Sparks of creativity will fly farther from happier minds.
- **Encourage parent involvement.** Send a letter home that tells of the process ahead. Parents should be advised how to support their child's creativity without doing all the work for them.

LESSON PLAN

"Be An Inventor" is a process that can take place over a few weeks, or if you desire, as much as several months. Here is a suggested sequence of events that you can follow at your own pace.

Phase 1 : Discuss the "Be An Inventor"

Process. Explain to your students that it is a step-by-step procedure that will eventually guide them toward being an inventor. Show the video as an educational overview, as well as an exciting jumpstart.

Study the World of Inventors

Phase 2 : Learn All About Inventions. They are everything human-made. They must be original & useful creations. They can also be processes. They should be appreciated for making the world a better place, etc. Conduct some of the suggested activities.

Phase 3 : Learn the Three Qualities of All Inventors. They are observers of the world, original thinkers, and builders. Conduct some of the suggested activities.

Phase 4 : Explore Creative Thinking. Everyone has the innate ability to create, but creativity can also be developed and taught.

By studying the world, relaxing, staying positive, brainstorming, and having fun while experiencing variety, we can heighten creativity. Conduct some of the suggested activities.

Begin Becoming an Inventor

Phase 5 : Start Invention Process by Observing the World to Find a Need. By watching their family and friends and openly examining the world, students can discover a problem that should be solved.

Phase 6 : Study the Problem to Imagine a Solution. Experiment and experience the many aspects of the problem, discuss, and brainstorm. Imagine a workable solution.

Phase 7 : Design Your Invention. Students plan its pieces, its shape, size, and materials used. They make a drawing of what it will look like and label all the parts.

Phase 8 : Build a Working Model, Test & Develop. Students follow their design to create a prototype. Their model should be considered an actual working model. They should test it and improve upon their design until satisfied with its performance.

Phase 9: Develop a Marketing Strategy. Students will create advertising "billboards" with important information, drawings of their inventions and explanations of problems solved and how they work. It will feature their own advertising slogan. Students apply for a patent, submitting their notebooks as proof of originality and usefulness.

Phase 10 : Have an Invention Festival. It can be as small as just your classroom or it can be as large as the entire school. You can even invite the parents. The students display their inventions with their billboards and tell others about why they should buy one. You can then award patents to prove that each student has completed the steps necessary to "Be An Inventor."

PHASE #1

Discuss the "Be An Inventor" Process

Explain to your students that they are about to embark on a process unlike any other they've done before.

Over the next few weeks or months, they will have an opportunity to become inventors!

Now, one doesn't just decide, "Hey, I'm going to go invent something and then I'll be an inventor." There is a process to it and the students should understand that they will follow a step-by-step plan that will guide them. This will be the framework in which their creativity can flourish and they can make something new that improves the world.

They will:

- Learn what an invention is and what are the two main features.
- Learn the three main qualities of all inventors.
- Learn some of the techniques used to enhance creativity and inventive thinking.

Then after learning about the world of inventions, they will:

- Start the invention process by observing the world to discover a problem or a need.
- Study the problem thoroughly and design a solution (their invention).
- Build an actual working model, test and develop it.
- Create a marketing plan.
- Take part in an invention festival.
- Be an inventor with the patent for proof.

ACTIVITIES

- Answer their questions. Keep in mind that many of the answers will appear to them as the process continues.
- Work together to understand the vocabulary of the world of inventors. Using the vocabulary sheet (BLM 1) as a guide, you can lead your student's through a network activity or a class discussion to achieve a consensus for the deeper understandings of words they'll soon be using more frequently. Your students will be preparing themselves to be inventors.
- Begin keeping an Inventor's Notebook. Inventors keep detailed records of the process of invention. Students should keep a folder that includes all of their invention documentation. It will have their reports, their invention vocabulary list, the ideas they've brainstormed, their invention's design with all parts clearly marked, a list of materials needed to build, and their patent, etc.
- Show the video, "**Be An Inventor.**" This thoroughly enjoyable video will provide a broad educational overview of the entire process ahead as it entertains your students and gets them excited about the prospect of being an inventor.
- Send home the letter to parents (BLM 2).

Study the World of Inventors

PHASE #2

Learn All About Invention

Share the following information with your students, then enjoy some of the activities.

What is an invention? Inventions are useful and original creations. They are things that are designed and built by humans to improve the world in which we live.

Too often, we only think of famous gadgets; the light bulb, cars, airplanes, computers, and the like. Inventions, however, are much more plentiful.

Inventions are everywhere. Look around you.

Everything that is human-made is an invention: Pencils, paper, erasers, desks, schools, houses, tea cups, toothpaste, buttons, and even the alphabet are all examples of inventions. A car is an invention, but if we look closely, we'll see that it is made of thousands and thousands of smaller inventions. Sometimes even animals invent; beaver dams serve them very well, thank you.

An invention can also be a process. A new method to scramble your eggs, or to unscramble a secret code, or a new manner of getting gold from a pile of dirt - as long as it is original - is an invention.

Inventions should be appreciated. Can you imagine life without many of the things we take for granted? Indoor plumbing was actually invented rather recently. Before that, people had to take baths with water that was pumped from an outside well, carried inside and heated on firewood stoves! Without the invention of language we would have an awfully hard time trying to explain ourselves. Can you imagine a world without glass? Without glass for our windows, we wouldn't even be able to drive our cars without crashing into each other!

ACTIVITIES

- Find and explain the dictionary definition of "Invention."
- Name some inventions that are -
 - famous or non-famous.
 - very unusual or common.
 - centuries old, very recent, or coming in the future.

- Create an A through Z list of inventions.
- Discuss what life might be like without some of the inventions on your lists. What would you do without them? How would your lives be different?
- Older students can write a report of what life might be like without a particularly useful invention.

PHASE #3

Learn the 3 Qualities of All Inventors

Share the following information with your students, then enjoy some of the activities.

Many people are inventors. Inventors are not just famous people such as Benjamin Franklin or Thomas Edison. If almost everything is an invention, then who invented them all? Who invented shoes, money, boats, egg cartons, ball-point pens, glue, buttons, or books? Countless millions of people are inventors. Women and men, boys and girls throughout history and from around the world are inventors.

Inventors are observers. They study the world. They have a special curiosity for what works and what doesn't and they search for the details of why things are the way they are. They watch people, animals, nature, and all of the things that fill the world.

Inventors are original thinkers. After they observe a need in the world, they think of a way to improve

it. They are free-thinkers with an open mind. They are confident and are not afraid to take chances or be different. They allow their daydreams to flow and they imagine creative solutions to common problems.

Inventors are builders. They not only dream, they do. An invention is not just an idea and it must be designed and built before it can work to help people. Inventors experiment and use their hands to try new ways to perfect their invention. They are persistent and even after many failures, they overcome their frustrations and work hard to make their inventions successful.

ACTIVITIES

- Discuss or write a report about who may be the unknown inventors of very ancient or common household inventions. When and where did these inventors live? Do you think they were rich and famous scientists? How did they think of their invention?
- Discuss what it means to be an observer, an original thinker, and a builder? Do you think everybody has some of these qualities?
- Discuss what Edison may have meant when he said "Invention is 1 percent inspiration and 99 percent perspiration."
- Have you or someone in your family invented an original way to do something? What was the problem? How did your invention work?

PHASE #4

Explore Creative Thinking

Share the following information with your students, then enjoy some of the activities.

Everyone is born creative. Children have a natural confidence and a curiosity that leads to inventiveness. Watching small children pretend is a lesson in creative thinking. But, creativity can be gradually discouraged in our ready-made, "do-as-I-say" world. Within us, we have a great storehouse of ideas and energy.

Your imagination is important. Through the tremendous power of creativity, we can learn by teaching ourselves, we can better understand ourselves and the world, we can solve some of the problems in our lives, and we can grow in spirit. We feel good when we create because we know that we have made the world a better place. Only through the magical power of creating, can we be fully healthy and happy and we must remember to free our natural creativity, explore it and play.

Creativity can also be a skill. Although natural to children, creativity can be studied and learned just like mathematics or writing. There are several common techniques: Brainstorming, relaxation and word association, as well as simple pretend games.

We should inspire confidence in each other by having faith in each other's ideas and thoughts. Be positive. All ideas have value and we should let them flow out and not speak negatively. Confidence is the key to creativity and with it, sparks of imagination will fly farther as we achieve the first step toward inventive thinking.

ACTIVITIES

- Brainstorm other uses for a simple object, such as a bar of soap or brainstorm new solutions to old problems, such as "How can I be sure to get my homework done on time?" No answer is silly or wrong and you should write down everything. After you've compiled an extensive list, then you could begin to edit. Discuss the value in all the ideas, even the seemingly bizarre. Understand how opening up to many ideas helps to view an old problem in a new way.
- Lead the students through a relaxation exercise. Ask them to close their eyes, breathe deeply and imagine their favorite spot in the world. Imagine you are there. Quietly ask, "What do you see, hear, smell or feel? Are people or animals there? What are they doing?" Explain that they are opening up their imagination.
- Play and pretend with a bunch of junk. Give your students film canisters, wires, clay, pieces of metal, tape, rubber bands, paper cups, etc. and let them create a piece of art, a new toy, or if they want, a wacky invention.

Begin Becoming an Inventor

PHASE #5

Start the Invention Process by Observing the World to Find a Need

Share the following information with your students, then let them begin the process.

You can make the world a better place. The world is really

a combination of a great, infinite number of smaller pieces, of which you are part. In constant motion, it fluidly evolves. You have the power to create and improve the world. But, before you can correct, you must first question. Feel free to wonder why things are the way they are.

Because inventions must be useful, we must first observe our world to discover a need.

Watch your parents, brothers, sisters, and friends. Listen carefully to what they say. Keep a careful eye out for a frustrating problem. Perhaps Grandpa often can't find his glasses or your dog always slops his food onto the floor. Maybe sometimes, while hammering a nail, mom hits her thumb.

PHASE #6

Study the Problem to Imagine a Solution

Share the following information with your students, then encourage their creativity.

Study the problem by experimenting with it.

Wear Grandpa's glasses as you walk around the house. Let your imagination go. Follow his footsteps, set the glasses down, leave the room and imagine how you could best quickly locate them.

Discuss it with Grandpa and others. Where does he usually forget them and what does he think would help?

Brainstorm ideas. By yourself or with others, let anything pop into your mind and make a list all of the many wild ideas. Later, review the list for creative solutions.

Relax. Give yourself time to develop the best solution. You should not feel rushed to deliver a quick and perfect idea. Once you've thoroughly studied the problem, let your mind quietly work on ideas while you go about doing other things. Sometimes the best ideas will come in your sleep or while you take a bath.

Narrow your ideas to the best workable solution. Remember, you will build a working model. If you have several ways to solve the problem, what idea will work best and what is most practical to actually make?

PHASE #7

Design Your Invention

Share the following information with your students, then encourage their creativity.

Plan before you build. No need to rush into building. Smart inventors sit down with a piece of paper and think through the building process before they start construction. Later, you'll save a lot of time and energy and your invention will be better if you plan ahead.

This is the heart of the art of inventing. Enjoy planning because this is really where the ideas emerge. What will your invention be? How will it actually work? How will it solve the problem to make the world a better place?

Think everything through. Will it have moving parts? What size should you make it? What materials will you use? How will it be fastened together? Glue? Tape? String? All of these questions should be thought out carefully. Make a drawing of exactly what your invention will look like. The drawing should be clear and should have all of the parts listed.

Submit a design paper for your invention

(BLM 3). You should put your design on paper and have it signed by a witness. This way, later, you'll be able to prove to others that it was your original idea. This paper, witnessed properly, could conceivably be used in court to prove your invention's date of originality.

PHASE #8

Build a Working Model, Test & Develop

Share the following information with your students, then encourage their creativity.

Okay, now its time to build. After you've decided on your invention and designed it, you can now construct an actual working model. This is called a prototype and will show everybody exactly what your invention is and how it works.

Follow your drawing plan, use the right materials and build it carefully. People will want to hold and try your invention so you will want it to be strong.

Test your model. Does it work to solve the problem? Test your invention several times and ask your friends and family for advice. How can you add to it or change it to make it better?

Development makes your invention better.

Remember, inventors are rarely satisfied. They are tinkerers who look for ways to improve their inventions. Don't be afraid to rebuild and improve on your invention. Try not to become discouraged. Remain positive and confident because great success always follows a few setbacks and a lot of hard work.

PHASE #9

Develop a Marketing Strategy

Share the following information with your students, then encourage their creativity.

Be proud. Your invention makes the world a better place and you should tell everyone about it. You will need to develop a sales plan that will make people want to have your invention.

Sell it by making a billboard display. Your advertising sign should be colorful and made of posterboard. It should include

- A labeled drawing
- The problem it solves
- A description of how it works
- A list of its benefits for the buyer
- A catchy sales slogan

Congratulations! After you have observed the world, discovered a problem, imagined a solution, designed and built an invention, you will then have made the world a better place and you'll ... Be An Inventor.

PHASE #10

Have an Invention Festival

Bring the inventions to school and share it **with the class.** Each student gets the opportunity to present their creation to their classmates. They show their

invention and its billboard. Each student "sells" it by enticing others with the benefits that it features while fulfilling a need. End the sales pitch with your advertising slogan.

You can have a big festival and invite the parents, brothers and sisters. It can be as small as one classroom or as large as the entire school. Your students will have the exciting opportunity to share their inventions with many adults, showing that they've worked hard and taken the steps needed to "be an inventor."

We invent. We overcome problems. We are constantly using the natural gift of invention and are all living examples that invention is not an historical occurrence from a select few. Even the personal growth and development of ourselves can be considered the invention of a unique individual.

We work toward the betterment of the lives around us. Our hearts are full and our minds energized when we create a better world.

Be An Inventor

VOCABULARY WORDS FOR DISCUSSION

As a class, come to a consensus for what each word means and how it relates to the world of invention.

Then write and keep a brief definition as notes for later.

Invent

Useful

Original

Observe

Brainstorm

Research

Design

Construct

Prototype

Develop

Marketing

Patent

Dear Parents,

Over the next month or two, your child along with her or his classmates will be taking part in the "Be An Inventor" process. First, they will learn about the inventive world. This includes the two main features of all inventions, the three qualities that we, as inventors, all have and the techniques used to enhance personal creativity.

Next, the students will be guided through specific steps to become inventors. First, they will observe their world to discover a problem or need, then they will design and build an actual working invention that solves the problem.

The students then design an advertising sign made of posterboard. The "billboard" shows a drawing of their work, a list of materials used, an explanation of how it solves a problem, benefits for a potential user and a catchy advertising slogan. They will then bring their inventions into class to make a sales "pitch" to their fellow students.

The students should not feel rushed to create an invention quickly. As they go through the process, their creation should naturally emerge. Parents are encouraged to support and help their children, while allowing the students to lead the activities.

Finally, we will have an invention festival where you are invited to come and see, hear and experience the many inventions that your child and other students will have created.

Feel free to contact me with any questions.

Sincerely,

Be An Inventor

MY INVENTION'S DESIGN

My Name _____ Teacher's Name _____

The problem that my invention will solve: _____

The name of my invention: _____

How my invention will work: _____

The materials that I will use: _____

A drawing of my invention:

Witness Signature: _____ Date _____

Patent Certificate

As _____ has adequately proven the creation of an invention named _____,

As above said person has, through study, learned of the world of inventions, inventors and the art of thinking creatively,

As above said person has observed the world to discover a need or a problem,

As above said person has used the powers of original thinking to imagine a solution to said problem,

As above said person has designed and built the above named invention that works to solve the said problem,

I hereby award you with an honorary patent, thus certifying you as having completed all of the steps and possessing all of the qualities necessary for you to "Be An Inventor."

The Duly Constituted Patent Authority